

In the claims:

Claims 1-59. (Cancelled)

60. (Currently amended) A method for improving the nutritional value of a phytate-containing foodstuff comprising:

contacting said phytate-containing foodstuff with a substantially pure phytase enzyme having an amino acid sequence ~~of a polypeptide of claim 15~~ as set forth in SEQ ID NO:10, such that said substantially pure phytase catalyzes the liberation of inorganic phosphatase from the phytate in said phytate-containing foodstuff.

61. (Currently amended) The method of claim 60, wherein said substantially pure phytase enzyme is produced by a recombinant expression system comprising a phytase-encoding nucleic acid having a nucleotide sequence selected from the group consisting of:

- a) SEQ ID NO:9;
- b) SEQ ID NO:9, wherein T can also be U;
- c) a nucleic acid encoding the amino acid sequence of SEQ ID NO:10,

wherein the expression of the phytase-encoding nucleic acid leads to the production of said substantially pure phytase enzyme; and

de) SEQ ID NO:7, wherein ~~390389~~ is G; ~~391390~~ is A; ~~nucleotide 438437~~ is T; ~~439438~~ is G; ~~440439~~ is G; ~~471470~~ is C; ~~473472~~ is T; ~~477476~~ is T; ~~448477~~ is G; ~~449478~~ is T; ~~690689~~ is G; ~~691690~~ is A; ~~692691~~ is G; ~~729728~~ is T; ~~730729~~ is A; ~~731730~~ is T; ~~864863~~ is T; ~~865864~~ is G; ~~10171016~~ is G, or any combination thereof.

62. (Original) The method of claim 60, wherein the liberation of the inorganic phosphate from the phytate in said phytate-containing foodstuff occurs prior to the ingestion of said phytate-containing foodstuff by a recipient organism.

63. (Original) The method of claim 60, wherein the liberation of the inorganic phosphate from the phytate in said phytate-containing foodstuff occurs after the ingestion of said phytate-containing foodstuff by a recipient organism.

64. (Original) The method of claim 60, wherein the liberation of the inorganic phosphate from the phytate in said phytate-containing foodstuff occurs in part prior to and in part after the ingestion of said phytate-containing foodstuff by a recipient organism.

Claims 65-90. (Cancelled)

91. (New) The method of claim 61, wherein the recombinant expression system comprises a vector comprising said phytase-encoding nucleic acid.

92. (New) The method of claim 91, wherein the recombinant expression system is within a host cell.

93. (New) The method of claim 61, wherein said phytase-encoding nucleic acid is operably linked to a polynucleotide encoding a signal peptide.

94. (New) The method of claim 61, wherein said phytase-encoding nucleic acid is operably linked to a transcription control sequence operable in a plant cell, a plant part or a plant.

95. (New) The method of claim 94, wherein the control sequence comprises a tissue-specific promoter that is specific for the plant cell, plant part or plant.

96. (New) The method of claim 94, wherein the control sequence comprises a constitutive promoter.

97. (New) The method of claim 60, wherein the foodstuff is for a non-ruminant animal.

98. (New) The method of claim 60, wherein the foodstuff is for a monogastric animal.

99. (New) The method of claim 94, wherein the plant cell, plant part, or plant is of a dicotyledonous species.

100. (New) The method of claim 94, wherein the plant cell, plant part, or plant is of a monocotyledonous species.

101. (New) The method of claim 60, wherein the foodstuff is an animal feed.

102. (New) The method of claim 62, wherein the foodstuff is an animal feed.

103. (New) The method of claim 63, wherein the foodstuff is an animal feed.

104. (New) The method of claim 64, wherein the foodstuff is an animal feed.

105. (New) The method of claim 97, wherein the foodstuff is an animal feed.

106. (New) The method of claim 98, wherein the foodstuff is an animal feed.

107. (New) A method for producing a transgenic plant, comprising:

(a) providing a recombinant expression system comprising a phytase-encoding nucleic acid having a nucleotide sequence selected from the group consisting of:

- i) SEQ ID NO:9;
- ii) SEQ ID NO:9, wherein T can also be U;
- iii) a nucleic acid encoding the amino acid sequence of SEQ ID NO:10,

wherein the expression of the phytase-encoding nucleic acid leads to the production of said substantially pure phytase enzyme; and

- iv) SEQ ID NO:7, wherein 389 is G; 390 is A; 437 is T; 438 is G; 439 is G; 470 is C; 472 is T; 476 is T; 477 is G; 478 is T; 689 is G; 690 is A; 691 is G; 728 is T; 729 is A; 730 is T; 863 is T; 864 is G; 1016 is G, or any combination thereof;
- b) providing a plant cell or tissue; and
- c) transforming the plant cell or tissue with the recombinant expression system.

108. (New) The method of claim 107, wherein the plant tissue is any one of a protoplast, a microspore, a pollen, or an explant.

109. (New) The method of claim 108, wherein the explant is a leaf, a stem, a root, a hypocotyl or a cotyl.

110. (New) The method of claim 107, wherein the step of transforming is by any one of microinjection, particle or microprojectile bombardment, direct DNA uptake, or electroporation.

111. (New) The method of claim 107, wherein the step of transforming is by a viral vector or a bacterial vector.

112. (New) The method of claim 107, wherein the step of transforming is by a binary vector system.

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In the drawings:

Please substitute the originally filed drawings and Figure 8 submitted on November 13, 2002, with the formal drawings submitted herewith. The formal drawings obviate any objections to margin errors. Figures 1 and 8 have been amended. A copy of Figure 8 (filed November 13th) with changes in red ink is provided. Support for the amendment to Figure 8 is in part by ATCC deposit No. PTA-4822